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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Scientific "Toy"

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A SCIENCE SERVICE PUBLICATION

ENGINEERING

Safer Super Highways

Suggest planting of Japanese multiflora rose along superhighways. It forms a matted hedge that would absorb collision shocks, thus reduce traffic deaths.

➤ RESEARCH STUDIES conducted by Motor Vehicle Research, Inc., South Lee, N. H., indicate that a popular Japanese rose, if planted along America's new superhighways, could cut traffic deaths.

The multiflora rose can be made to grow into a matted hedge from six to ten feet tall. It gently absorbs the shock of collision when an automobile runs off the road. In contrast, large trees absorb the shock abruptly, endangering the car's occupants.

Test cars have plowed into a heavy growth of the Asiatic rose at speeds up to 30 miles an hour. The tangled branches stopped the car in 11 feet without harming driver or passengers.

Such stops approximate "panic stops" on the highway when motorists jam on the brakes in emergencies. The researchers said they believe these crash stops could have been tolerated even at speeds of 50 miles an hour.

Andrew J. White, director of MVR, Inc., states that accident investigations over many months have revealed that many lives are saved by small trees and shrubs along highways.

This led him to seek a hardy, rugged scenic shrub that could be planted along the margins of superhighways and in the middle dividing strip often filled with grass. Ideally, the shrub should thrive in many types of soil, require little or no attention, restrict its growth height and retain its automobile-braking qualities even when denuded of foliage in winter.

The multiflora rose seems to offer the best compromise of all the desired qualities.

Mr. White adds that such landscaping of highways also would produce these benefits: reduced headlight glare at night from oncoming cars, reduced force of wind gusts which sometimes make driving difficult and reduced numbers of domestic and wild animals on the road. The rose hedges also might double as living snow fences.

He estimates that highways could be equipped with the multiflora rose at about five cents per foot of road. The plants will grow after being crushed by a car and "cannot be killed out, even when burnt over," he added.

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GEOLOGY

Early Jadeite Mine

➤ THE ARCHAEOLOGICAL puzzle of where the ancient people of Central America got the beautiful jade from which they carved the delicate little figures of their gods in the days before Columbus or even before the Christian era, as early as 100 B.C., has been partly solved.

The solution came in the form of samples of hard, slightly greenish rock sent to scientists at the Smithsonian Institution by Robert E. Leslie of Guatemala City. He had found it in a newly re-discovered mine on the Motagua River near Guatemala City.

The mineral was identified by Dr. William F. Foshag, head curator of geology at the Smithsonian, as valuable jadeite of a quality just below that of gem standards.

New World deposits of the jade mineral found previously have provided a very scanty source of the precious stone. Very small amounts are mined in California, but most of it comes from China.

The art of jade carving is also most common in the Far East. The fact that this art was commonly practiced by the Olmec and Maya prehistoric Indians has led some archaeologists to theorize that these cultures might have originated in Asia.

But the jade used mostly in Chinese carvings comes from the mineral nephrite, whereas the stone used by the Mayas and the samples obtained by Mr. Leslie are jadeite, which is much more valuable.

Finds of other still undiscovered sources of jade may be expected, Dr. Foshag believes. Pre-Mayan artists in Costa Rica worked with a distinctive, slightly bluish jadeite and the pre-Aztec people of Mexico used a greener jade than that found in Guatemala, he pointed out.

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MEDICINE

Encouraging Outlook For Heart Disabled

➤ A PESSIMISTIC attitude regarding the long-range outlook for patients with the kind of serious heart disease called coronary occlusion is to a large extent not justified, statisticians and medical men of the Metropolitan Life Insurance Company in New York find.

They base their opinion on a study of 166 men who were completely disabled by this heart condition long enough to receive disability benefits under contracts issued in connection with their life insurance.

In coronary occlusion, one of the arteries supplying the heart's muscle is blocked and that part of the muscle may die.

Of the 166 men studied, no less than seven out of every 10 lived five years or longer, about half lived 10 years or longer and about one-third lived 15 years or longer. The men between 40 and 49 years at the time of the disability did somewhat better than those between 50 and 64.

In the first five years following the disability, about one-sixth of the men returned to work or were judged able to do so by competent doctors. The proportion returning to work was greater among those under age 50 when disabled. Many of those who did not go back to work could have and, the report states, "might have been better off if they had."

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FORESTRY

TVA Ready to Harvest Trees Planted in 1934

➤ HARVESTING OPERATIONS will begin after the first of the year on a crop of pine trees planted between 1934 and 1938 by the Tennessee Valley Authority on reservoir areas.

Over a five-year period, 50,000 cords of pulpwood will be cut on 8,000 acres of land. Private companies have agreed to pay the government $3.10 per cord for the wood.

This is the first harvest of pulpwood on TVA lands. The trees were planted on eroded and otherwise unproductive land in Alabama, Georgia, Mississippi and Tennessee.

Forestry officials of the authority plan other thinnings of the timber lands for pulpwood before a final harvest of sawlogs.

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VETERINARY MEDICINE

Fungus in Feed Cause Of Cattle X-Disease

➤ A FUNGUS discovered in feed pellets and a food concentrate may be one cause of the "mystery malady," or X-disease of cattle now called hyperkeratosis, the American Veterinary Medical Association states on the basis of findings by Lt. Col. Walter T. Carll of the Army Veterinary Corps.

Highly chlorinated naphthalenes found in some lubricating oils can cause the disease, it has been discovered. Contamination of feed from these oils used in farm machinery has been considered the cause of the disease which has taken a heavy toll in recent years.

The Army veterinary officer's finding that typical symptoms of the disease can be caused by the fungus suggests this as another possible cause. Col. Carll believes it "premature" to state definitely that the fungus is the cause of the disease, but the veterinary association urges further research to determine the cause.

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DENTISTRY

Teeth X-Ray by Toothpick

Wooden applicator stick, with radioactive material for its "head," suggested to replace bulky X-ray equipment now used to get pictures of teeth.

➤ WHEN DENTISTS take X-ray pictures of teeth in the future, they may do it without an X-ray machine.

A wooden applicator stick, something like a long toothpick, with some radioactive material rounded on the end of it like a match head, will be held against the jaw or tooth, either inside or outside the mouth. This will produce a picture on an X-ray film packet held in the appropriate position.

Successful experiments using radioactive cesium for the X-ray source in taking such pictures of teeth in a skull are reported by Drs. Harry D. Spangenberg Jr. and M. L. Pool of Ohio State University, to the *Journal of the American Dental Association* (Dec.).

Ordinarily, they explain, X-rays are produced with a vacuum X-ray tube and a high voltage power supply. But the nuclei of certain atoms are also a source of X-rays. Without any vacuum tube and without any high voltage, these nuclei "of their own volition" cause emission of X-rays of intensity directly proportional to the number of nuclei present.

The small intensities produced by radioactive cesium used for their experiments with a skull are not effective for practical use in taking X-ray pictures of teeth in a living head. But Drs. Spangenberg and Pool declare it is "a distinct possibility" that other radioactive X-ray emitters will be discovered which can produce an X-ray beam of sufficient intensity and proper wavelength "to make possible its clinical use as a source of X-ray radiations."

The radioactive X-ray emitters are so small they may be placed in many parts of the body, thus making it possible both to obtain clearer photographs than might be obtained by the usual X-rays and to obtain photographs of portions of the body heretofore considered inaccessible for X-ray detection.

The light weight of the equipment and elimination of an electrical generator or bulky transformer are other advantages. Shielding equipment, a time exposure device and the small radioactive X-ray source are all that is needed.

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NIGHT INTRUDER—Newest addition to the U. S. Air Force is the twin-jet night bomber, B-57, adapted from the basic design of the Royal Air Force Canberra. It is the first night intruder bomber that has been purchased by the Air Force.

• RADIO

Saturday, Dec. 19, 1953, 3:15-3:30 p.m. EST

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. A. P. Black, head, department of chemistry, University of Florida, Gainesville, Fla., and past president, American Water Works Association, will discuss "America's Cheapest Raw Material—Water."

MEDICINE

Antibody Level Key To 'Flu Prevention

➤ KEY TO prevention of an influenza epidemic is the level of anti-influenza antibodies in the blood of the population, Dr. G. O. Broun of St. Louis University School of Medicine, St. Louis, Mo., reported at the meeting of the American Medical Association in St. Louis.

If the level of these 'flu-fighting antibodies gets low, as shown by tests of pools of blood samples from the population, it could be used as a signal for vaccinating against influenza. Which vaccine to use could also be told by such tests which would show the type of influenza to use in a vaccine. If antibodies to Type B were scanty, that type should be in the vaccine. If antibodies to another type were scanty, that type would be needed in a protective vaccine.

For two and a half years, Dr. Broun examined pools of blood serum collected each week from the population in this area. Following an epidemic of Influenza Type B in 1952, antibodies to this type increased in the serum pools. Following an epidemic of Type A prime in 1953, antibodies to this type were found in increased numbers.

More important for prevention, Dr. Broun said, the serum pools showed decreases of the antibodies to each type of influenza in the months immediately before the epidemic.

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ANIMAL NUTRITION

Mysterious L-Factor Helps Eggs Hatch

➤ A MYSTERIOUS L-factor investigated by a graduate student at Texas A. and M. College may save poultrymen millions of dollars each year by increasing the number of hatchable chicken eggs.

Bobby L. Reid has discovered that the factor found in water-soluble liver concentrates and fish solubles exerts a strong influence on the number of hatchable eggs a hen lays.

Diets without L-factor reduced hatchability to 25% or less of normal, while the factor added to the diets increased hatchability to 10% more than normal.

It has been estimated that poultrymen lose $35,000,000 each year by setting eggs that do not hatch. Normally only 68 out of every 100 eggs hatch. If L-factor can be isolated and produced, it would reduce this loss significantly.

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GENERAL SCIENCE

Chain Letter Lottery

Chain letters, considered a kind of fraud by the Post Office Department, are again being sent around the country, but human nature, not mathematics, prevents their success.

➤ HUMAN NATURE, not mathematics, prevents successful operation of the "get-rich-quick" chain letters, even if the Post Office Department did not object strenuously on the grounds of the scheme being a lottery.

Every few years there is a wave of chain letters. During the war, in 1942, it was linked to defense stamps and war bonds. In 1935 it involved dimes, whereas this year the ante has been raised and now the amount of money involved is $2. One kind of letter asks the sending of golf balls.

Even a person continuing the chain is liable to prosecution, Post Office officials declared.

The Post Office regards the chain letter as a species of fraud or lottery, the "collection of money without sale of merchandise" (U. S. Code Title 18, sections 336 & 338).

In the present version of the chain letter, the gullible are presumably persuaded that they will receive $6,250 for the expenditure of $2.18, of which $2 is sent to a person whose name is at the head of a list and 18 cents is spent on stamps on six letters, not counting the cost of writing the letters.

The letter received contains a list of five names. The recipient is supposed to send $2 to the top name on the list and cross off the name. If you receive such a letter and fall for it, you add your name to the bottom of the list, copy the list and letter five times and send them to five people who you deem sufficiently gullible. So the racket is supposed to go on.

By the time your name climbs to the top of the list, $5 \times 5 \times 5 \times 5 \times 5$, or five raised to the fifth power, or 3,125 persons will have been directed to send you $2, and your name will have been deleted from 3,125 letters. That is the end of round one. You are now out.

At the beginning of round two, 3,125 persons will each expect or hope that 3,125 other persons will each send him $2. At the end of round two the number of persons involved will be $3,125 \times 3,125$ or 9,765,626, which is five raised to the tenth power.

This is a geometrical progression. At the end of the third round, if everybody stayed in, the number of persons involved would be five raised to the 15th power or 30,517,578,125. Since this is about 200 times the adult population of the United States, every adult would have received the chain letter on the average of 200 times.

Theoretically, at the end of a fourth round, 95,367,431,640,625 persons would be involved. This is 95 trillion, or 95 million million.

If, on the other hand, only one person out of five of those who receive the chain letter responds by writing his five letters, you would receive, when you reach the top of the list, just $10. And no one would receive more no matter for how many rounds the game continued in this manner.

One out of five or 20% is just sufficient to keep the chain going. Any less response, and the chain soon fizzles out. And a less response is quite likely. Business men who send out appealing sales letters regard 3% response as remarkably good.

Repeats begin early. Everyone after all lives in a small world. The contagion spreads but slowly from the community where it started. Anyone who has received the chain letter two or three times is already sick of the game.

Geometrical progression, only another name for compound interest, as an easy means to fabulous wealth has always been intriguing. An offer is made like this: "Give me a cent, and double the amount each day for 30 days, and at the end of that time I will buy you a fine automobile —government permitting. I could well afford it, for you would have paid me $21,474,834.07."

And there is the old story about one cent invested at 5% compound interest at the time of the birth of Christ. If one of your ancestors had had the foresight to make such an investment for you, your fortune today would amount to four globes of solid gold, each the size of the earth.

But the trouble with these dreams is they never work out. Always the chain is broken, and usually quite near the start. That is what will happen with the present wave of chain letters.

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SURGERY

New Instrument to Dilate Heart Valve

➤ VICTIMS OF a serious heart deformity known as "aortic stenosis" have been promised relief through a new surgical instrument developed at the University of California at Los Angeles Medical Center.

Aortic stenosis is caused by rheumatic fever. It involves a calcifying or hardening of valves controlling the flow of blood from the heart to the arteries.

The new surgical instrument was designed by Dr. William Muller. It is a simple dilating tool that is introduced through a chest incision into the aorta, the main trunk from which the arterial system proceeds. It is designed to tear the calcified valve along its points of fusion or at a weak point in the valve leaflets, permitting a normal flow of blood through the valve.

Dr. Muller has operated successfully upon nine patients. Encouraging results to date indicate that the procedure may help many victims of the deformity, who have found little hope in other approaches.

The technique used by Dr. Muller is similar to that used by Dr. Charles Bailey of the Hahnemann General Hospital in Philadelphia, with the exception that the instrument employed is of a different design.

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ELECTRONICS

New Germanium Transistor

➤ A TINY fleck of germanium some day may save many lives at sea by sending out a radio beacon signal to guide rescue planes directly to persons in distress.

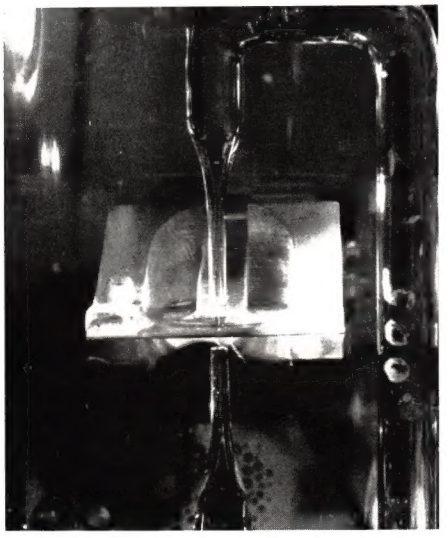
The germanium leaf, about two ten-thousandths of an inch thick, can be made into an oscillator that is attached to life-boats. When in contact with sea water, the tiny device manufactures the radio signals to guide search-rescue planes.

This possible application of the germanium leaf was described by David B. Smith, vice-president of research at the Philco Corporation, Philadelphia. Mr. Smith told the Franklin Institute and the Institute of Radio Engineers that this new germanium transistor also can be applied to electronic "brains."

Most transistors so far have been restricted to "non-critical" tasks in hearing aids and other devices where the transistor's stability is not greatly important. However, the production of a transistor with reliable performance in high radio frequencies will open new civilian and military horizons to the tiny devices.

The new transistor, etched to its delicate thinness by two tiny streams of liquid indium salt, is said to work at frequencies up to 70 megacycles—which includes the military very-high-frequency communication band.

It promises to make possible portable military communications receivers that work on only two flashlight cells. Because of the transistor's small size and its tiny power consumption, the military receivers can be shrunk to the dimensions of a cigarette pack, which would have many advantages over more bulky equipment.



ETCHING GERMANIUM—Shown here is a magnified picture of the electrochemical etching of a small germanium slab to make the "surface-barrier" transistor. The tiny jets contain an indium salt.

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STATISTICS

Moves Are to Cities

➤ IN SPITE of the fact that big cities are a "natural" target for atom bombs, Americans keep moving to town. This is shown in an interpretation of latest census reports by the Population Reference Bureau in Washington.

"Now, at a time when atomic-hydrogen warfare could blow our cities to bits, we are building up ever heavier concentrations of people in urban areas," the report comments.

During the ten years from 1940 to 1950, the city-dwelling population grew by 14,500,000, and this is about three-fourths of the total population increase.

The American people are restless folk, the report indicates. Not only are they moving from country to city; they are shifting about from state to state, from coast to coast. The trek is mostly toward the West. The West has almost tripled its share of the total population, while the area east of the Rockies is losing people. In 1950, more than 35,000,000, or 23.5% of the population, lived in states other than the one of their birth. This compares with 17.8% in 1900.

Pennsylvania lost the most people—1,185,000. California and Florida showed the greatest gains, 4,922,000 for California and 1,072,000 for Florida.

Although internal migration has kept up an active stream, the number of people coming to this country from abroad has dropped to a mere trickle. Even in New York, which has the highest proportion of foreign born, three-fourths of citizens over 21 were native born in 1950.

Americans are growing older at a rather rapid rate. The proportion of people over 65 has doubled since 1900. In 1950, there were more than 12,000,000 people over 65.

Americans are becoming better educated. Those over 25 have completed on the average 9.3 years of schooling. The figure in 1940 was 8.6. The greatest gain was where the lack was greatest, among the Negroes. The figures for non-whites rose from 5.8 to 6.9. For city people, the figure is 10.2, a gain from 9.3.

Americans are marrying younger and are having more children. The birth rate reached an all-time low in 1933. It began to rise in 1937 and reached a peak in 1947, and since has declined only slightly.

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NATURAL RESOURCES

Land Conservation Needs Re-shaping

➤ "CONSERVATION FOR destruction" has often resulted from land-use policies followed on public lands in the West, Dr. George H. Hart, dean of the School of Veterinary Medicine, University of California, told the second annual meeting of the Agricultural Research Institute in Washington.

In the past, scientists have designed their land-use programs on the huge public lands without consideration for animal life, he declared. The result has been that brush piled up. Then fires, started by lightning in the brush, could not be controlled.

Dr. Hart urged that all land-use policies consider animal-plant unity. Feeding of animals on land reduces the amount of piled up brush and therefore keeps the fire hazard down, he said.

Millions of acres of public lands as well as mesquite and sagebrush land in the West must be utilized if the nation is to have enough meat, Dr. Hart pointed out.

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VETERINARY MEDICINE

High Blood Pressure Kills Old Chickens

➤ HIGH BLOOD pressure is one of the causes of death in old chickens, Dr. Paul D. Sturkie, poultry physiologist at the Rutgers Agricultural Experiment Station, New Brunswick, N. J., has found.

After perfecting a method of taking the blood pressure of birds, Dr. Sturkie discovered that blood pressure increases in birds with age just as in humans. The blood pressure of male fowl is much higher than female, the investigation showed.

The research was stimulated by the fact that about half of the adult birds lost each year die of non-infectious diseases and old age. Dr. Sturkie's study established that one cause of death in old birds was high blood pressure.

The percentage increase in blood pressure in chickens 10 to 42 months of age is almost the same as in human beings 20 to 65 years of age, it was reported.

On the basis of this experiment, poultry breeders may be able to increase the life span of chickens by selecting for breeding purposes those hens whose blood pressure does not change much with age.

Attempts are also being made to relate blood pressure to egg size, number of eggs, longevity and other money-making factors concerning the poultry industry.

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ANTHROPOLOGY

Africa as Man's Cradle

Remains of Australopithecus, thought to be a true "missing link," are believed to be considerably older than those of Java Ape Man and Peking Man.

➤ THE CRADLE of man is probably in Africa. Although it has been impossible to assign a definite accurate date to the remains of Australopithecus found in the Transvaal of southern Africa, he is believed to have made his home in the limestone caves there long before the time of Java Ape Man and Peking Man, Asiatic claimants to the title of man's oldest ancestor.

The fact that Piltdown Man was sawed off man's family tree when this famous skull was found to be a hoax with a doctored up jaw bone of an ape does not greatly alter the anthropologist's present view of man's ancestry. (See SNL, Nov. 28, p. 350.)

Piltdown Man of England, now exposed as a fake, and Neanderthal Man, widespread over Europe, have long been considered at best "uncles" not in the direct line of descent of modern man.

But some leading authorities on man's origin are now convinced that Australopithecus was really man's ancestor, a true "missing link" between the lines of ancestry of the great apes and man or close to it.

Creature Walked Erect

The child's skull found at Taung's, first find of something like 30 individuals now collected in the same general region, had a brain much smaller than that of modern man, but the way the head was set on the spine and the shape and position of the pelvic bone indicated that this little creature walked erect like a man. The way his baby teeth were worn indicated that his jaw was hinged like a man's and that he chewed his food with a rotary motion like a man and not straight up and down like an ape.

The teeth in the jaw long thought to be associated with the Piltdown Man skull were said to have been filed down to imitate this human type of wear—a "forgery" done cleverly enough to launch many years of controversy in scientific circles.

Scientists are often skeptical of the remains of ancient men and animals dug out of the earth's crust. There are reported "discoveries" that were never accepted and never got into the record of science.

Piltdown Man was never accepted fully by many anthropologists. It was not a complete surprise when he was proved to be a fake. The scientists who trusted the early findings of an amateur scientist and lawyer, Charles Dawson, in the years just before World War I are more hurt than angry—hurt that their confidence has been abused and someone, as has been quipped, "made a monkey out of them" as well as Piltdown Man and Dawson.

The original finds made by Dawson were fragments of the skull. When he showed these pieces to scientists at the British Museum, he learned that they were very interesting. An intensive search followed at the site in Sussex for additional pieces. It was later that the jaw bone and teeth were discovered where perhaps they had been "planted."

Although Piltdown Man has now been discredited as a "Dawn Man," he has not completely lost interest for scientists. Although the spurious jaw has been found not to belong to the skull fragments, the skull itself is still thought to be definitely human although probably not more than 50,000 years old. This makes it much less interesting because scientists have perhaps half a hundred specimens of this age. It would make it a modern man about contemporaneous with Cro-Magnon Man.

Java Ape Man

When bone fragments are found in the ground, scientists always question whether they all belong to the same individual, or even the same age. Java Man is another specimen which has been under suspicion.

A Dutch physician, Eugene Dubois, found this partial skeleton in the latter part of the nineteenth century. The find consisted of the top of a skull, three teeth and a thighbone. The femur is straight, and if it can be considered as truly belonging to the same individual who or species who owned the skull in life, then Java Man, although similar in many ways to the ape, walked erect like a human being. If his bones are restudied with modern anthropological methods, it may very well be found that Java Man, like Piltdown Man, is a composite and that all his bones never existed in a single frame.

Estimated Age Varied

Hint of how scientists had been misled as to the age of Piltdown Man was given as early as 1949 by Dr. K. P. Oakley of the British Museum when he gave an age of 100,000 years to the bones. Before that estimates of his age varied all the way up to 1,000,000 years.

The fluorine method, unfortunately, cannot give an absolute date to any bones studied. It depends upon the fact that bones buried in the ground gradually take up fluorine from the soil. The speed of the process depends upon the conditions of moisture in the soil and upon the concentration of fluorine. When several sets of bones are found at the same site, the fluorine content can show which of them is older and by approximately how much. This cannot be done, however, when one set of bones is found in England and another in France or Asia.

With the removal of the "Dawn Man" of Piltdown from the earliest branches of the human family tree, interest of students of early man now centers in Asia and Africa.

Africa has given us the large family of Australopithecinae. This covers a large variety of human or near human forms—giants and pigmies. One, the "Taungs baby," probably represents a true missing link—a creature who walked like a man and chewed his food like a man, but who had a very small brain and thick skull.

New African Discovery

Just this year a new discovery was made by an anthropologist of the Transvaal Museum in Africa of what he believes to be the oldest true man, who lived in the Upper Pliocene. (See SNL, Dec. 5, p. 355.) If this discovery stands the test of scientific scrutiny and criticism, this will put the birthplace of true man about 25 miles northwest of Johannesburg.

Asia has given us Gigantopithecus, but knowledge of this ancestor is limited to a single enormous tooth. On this basis alone he is visualized as a huge individual. The island of Java has provided bones of a variety of early men or pre-human creatures.

From China comes Peking Man. The original bones of this find disappeared during World War II, and the charge has been made that the U. S. stole them, but they have not yet turned up either in this country or elsewhere. Peking Man lived in the Middle Pleistocene.

England's principal remaining claim to early man is Swanscombe Man, now dated as "more than 100,000 years" old. Probably of the same age or older is the Heidelberg Man of Germany, represented by a jaw, and also a find at Fontechevade in France which, however, has been given the conservative scientific verdict of "probably at least 50,000 years" old.

Cro-Magnon Man is between 25,000 and 50,000 years old.

Scientists do not know just where to place Neanderthal Man in the family tree. It seems probable now that he is just an uncle to modern man, not in the direct line of descent. The trouble with this beetle-browed individual is that his remains have been found scattered over a very wide area in Europe, the Near East and even elsewhere.

The earliest specimens are probably 150,000 years old. Specimens found in the west are much less like modern man than the eastern remains which are much older. This looks as though the Neanderthalers went through an evolution which carried them away from the human branch of the tree.

HOKKAIDO BEAR—Gift of a high school student, just returned from a visit to Japan, to the National Zoological Park in Washington is the Hokkaido bear shown in the photograph, an animal very rare in captivity.

AERONAUTICS

Many Skills for Rocketry

➤ TO THE nation's space-minded youth, the National Advisory Committee for Aeronautics has this to say:

It takes all kinds of skills and professions to fill the ranks in rocketry. Any basic type of engineering degree can qualify its holder for a profession in some aspect of rocket research.

No college today offers a degree in rocket engineering. This partly is due to the swift pace at which the field is progressing, states Robert J. Lacklen, NACA personnel officer.

Young men and women who want to work in aviation research do not need to have aeronautical engineering degrees necessarily, he said. This is because much research work now lies between academic fields.

It takes the aeronautical engineer, the mechanical and the metallurgical engineer working as a team to produce some of today's craft. This is because of the great interrelation of the various fields in modern airplanes.

Persons with degrees in any of these fields are qualified to enter some aspect of NACA research in rocketry: mechanical, aeronautical, electrical, chemical, metallurgical and ceramic engineering; physics; engineering physics; metallurgy and chemistry.

Many young men are being placed in NACA research units while still in school. Cooperative curriculums springing up in colleges throughout the country now are helping the organization fill its many vacancies. Sophomores are hired on a half-time basis at $2,750 a year.

These cooperative programs, Mr. Lacklen said, are helping to relieve the critical shortage of technically trained personnel. He revealed that the NACA, which conducts investigations into 23 areas of aeronautical research, was able to fill only one-fourth of its existing vacancies last year.

Mr. Lacklen urged young men of draft age to take advantage of their military service by applying for training in technical specialties. Enlisted men often can work in such areas as communications, electronics, engine and aircraft mechanics, all of which can help the man professionally later on. Officers also can apply for training in specialized fields allied with aeronautics.

Science News Letter, December 12, 1953

A U. S. bituminous coal miner produces as much *coal* in two days as a Japanese miner does in 30.

In air, a *bullet* dropped from the hand will strike the earth a fraction of a second sooner than if fired from a rifle parallel to the earth and at the same height; in a vacuum, a dropped bullet and a fired bullet will land at the same instant under these conditions.

ZOOLOGY

High School Junior Gives Zoo Rare Bear

➤ A 16-YEAR-OLD high school junior has given the National Zoological Park in Washington, which is his home town, a rare Hokkaido bear cub he found in a Japanese vegetable market.

John Pielmeier was in Japan visiting his father, a civilian government employee, when he found the cub, then a few weeks old, in a market.

Hokkaido bears are "very rare" in captivity, Dr. William Mann, director of the zoo, said in accepting the gift. The bear is related to the European brown bear and is found on Hokkaido Island, home of the primitive Ainu people. The bear is worshipped by these people, Dr. Mann said.

Interested in animals of all kinds, young Pielmeier is planning to go into the cattle business when his education is completed. The bear was flown to this country and is now on exhibition at the zoo.

Science News Letter, December 12, 1953

GENERAL SCIENCE

Political Ax Hitting Mental Hospitals

➤ THE POLITICAL ax which has hit men and women in government service since the elections in 1952 has lately been striking state mental hospital systems in about one-fourth of our states.

The story is being told in letters from mental hospital superintendents to the American Psychiatric Association in Washington. Sometimes bitter, sometimes courageous, always disheartening, these letters tell of key personnel being chopped from the staff and replaced by political appointees who may or may not have the necessary qualifications. The ax has fallen on doctors, nurses, engineers and farm managers among others.

Gains made in recent years in care of the mentally sick are now seriously threatened, the American Psychiatric Association fears. Its president, Dr. Kenneth E. Appel of Philadelphia, describes the situation this way:

"In several states newly elected administrations have yielded to the temptation to embroil the state mental hospitals in party politics. Under one pretext or another they have removed physicians and other professional personnel hired by a previous administration. They have cut already entirely inadequate hospital budgets under the guise of 'economy.'

"The mental patients and their families are, of course, the ones who suffer most."

The situation fortunately does not exist in all states. In some, the ones that have the best public mental hospitals, Dr. Appel pointed out, professional hospital personnel has long since been given status and tenure and has been protected from "the ebb and flow of political changes and interference."

Science News Letter, December 12, 1953

PHYSICS

A-Bomb Debris Element In Contracting Stars

➤ AN ELEMENT that is unknown on earth except when made by atomic bombardment as in the A-bomb exists in large quantity in some giant stars.

A new theory of how technetium, element 43, once a mere hole in the chemical table of elements, is created in the stars by thermonuclear reactions was presented to the American Physical Society meeting in Chicago by Dr. A. G. W. Cameron of Iowa State College.

Thermonuclear reactions are the sort that are involved in the H-bomb, in which the lighter elements are fused with loss of matter that is converted into energy. When hydrogen which fuels such a reaction is exhausted in a giant star, the core is expected to contract and the central temperature rise until thermonuclear reactions with helium begin. When the temperature reaches approximately 100,000,000 degrees on the absolute scale, in Dr. Cameron's theory, a kind of heavy carbon, atomic weight 13, when bombarded with an alpha particle or helium atom, would create an oxygen atom of the ordinary sort, weight 16, and give off a neutron.

The plentiful supply of neutrons thus generated would be captured by heavier elements that are in the star and change them into the kinds of elements that the spectra of light from the stars show to be present. Among the elements formed in this way would be technetium, non-existent in stable form on earth but plentiful in these stars.

Science News Letter, December 12, 1953

BIOCHEMISTRY

Muscle Built Through Action of Glutathione

➤ MUSCLE AND other protein tissue of the body may be built up through the chemical action of glutathione.

This is a theory of Dr. Daniel Mazia, professor of zoology at the University of California, who developed it from research with sea urchin eggs. (See SNL, June 13, p. 361.) He sees glutathione as a sort of coordinator in chemical by-play which adds structural elements to living cells. Glutathione, which is itself "protein-like," builds up proteins by its effect on sulfur atoms in protein molecules.

Scientists have found growing evidence recently that sulfur is of vital importance in basic life processes.

Dr. Mazia suggests that glutathione may have the capacity to break the bonds between sulfur atoms in protein molecules, then to link two or more molecules together by joining the "hanging" sulfur atoms. He believes the glutathione is not used up in the process, but simply makes it work.

Glutathione is made from some of the same building blocks as proteins, but put together into a smaller package and in a different way. The chemical occurs in most body tissues, it is important in respiratory enzyme system, and deficiencies have resulted in cataract formation in the eyes.

Dr. Mazia presented his theory at a symposium on glutathione, sponsored by the National Science Foundation, at Ridgefield, Conn.

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RADIO ASTRONOMY

Radio Star's "Noise" Dimmed by Sun's Corona

➤ ASTRONOMERS EXPECT next June, for the third and possibly last time in several years, to measure how large the usually invisible solar corona is when "viewed" by radio waves. It may be as much as 15 times larger than the visible sun, observations by Dr. F. G. Smith and his associates at Cavendish Laboratory, England, have indicated.

Dr. Smith revealed plans for recording the scattering, or dimming, of short radio waves from a noisy radio "star" as the sun passes between the star and the earth next June. The radio source is in the constellation of Taurus, the bull, and is thought to be the Crab Nebula, expanding remnants of a star that was seen to burst into a nova almost a thousand years ago.

The radio astronomers plan next June to confirm observations, made on this source in the last two years, showing irregularities in the solar corona at extreme distances from the visible surface, many times farther than that observed visually.

After 1954, radiation from sunspots will be very likely to spoil chances of observing the "radio occultation" of Taurus, Dr. Smith, now a visiting scientist at Carnegie Institution of Washington, said.

Attempts to record the radio wave dimming were made this year at 38, 81.5 and 210 megacycles. Observations were successful at 38 and 81.5 megacycles, but no effects were found at 210 megacycles, according to Dr. A. Hewish, also of the Cavendish Laboratory. Results of the 1953 observations will be reported in *Nature*.

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MEDICINE

Patients to Give Selves ACTH Like Insulin

➤ PATIENTS WITH under-functioning pituitary glands will in future be giving themselves ACTH just as diabetics give themselves insulin now to remain well.

This prospect is foreseen by Dr. Ralph A. Kinsella Jr. of St. Louis University School of Medicine.

A 67-year-old man whose pituitary gland in the head was practically destroyed by a tumor has been living for three and a half years and is still in good health through regular prescribed doses of ACTH (Gel), Dr. Kinsella reported at the meeting of the American Medical Association in St. Louis.

Science News Letter, December 12, 1953

IN SCIEN

BIOLOGY

Hours of Light Control Breeding of Sheep

➤ SHEEP AND goats breed out-of-season when their days are shortened artificially, Dr. Orson N. Eaton, National Academy of Sciences, and Victor L. Simmons, U. S. Department of Agriculture, have found.

Normally, these animals breed in the fall during the period of decreasing daylight. This gives a crop of spring lambs for the sheep and summer milk production for the goats.

The scientists found that if the animals were kept in rooms with controlled amounts of light, many would breed in the spring and summer producing lambs and kids in the fall.

The birth weight of the fall lambs and kids was less than spring animals, and deaths were more frequent at birth and during the first month of life with the animals born in the fall.

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ASTRONOMY

Galaxies in Collision Not Radio "Star" Source

➤ GALAXIES IN collision may not be the source of the radio "star" in Cygnus, Drs. R. C. Jennison and M. K. Das Gupta of the Jodrell Bank Experimental Station report in *Nature* (Nov. 28).

Last year Drs. Walter Baade and Rudolph L. Minkowski of Mount Wilson and Palomar Observatories reported that they had spotted a visual object that had the same position as the strong radio signals picked up here on earth from the constellation of Cygnus, the swan.

Now, using a radio telescope that allows them to pinpoint more accurately the exact spot from which the radio waves are coming, Drs. Jennison and Das Gupta have concluded that "there would appear to be no direct correlation between the radio emission and the visible light from the colliding galaxies."

The radio source, they find, is much larger than the visual object spotted by Drs. Baade and Minkowski. The radio source actually consists of two distinct parts, one on each side of the visual object, thus straddling it "with little overlap between the regions of optical and radio emission."

Since the visual object in Cygnus that is straddled by the radio source is the only case yet observed of galaxies in collision, many astronomers believe it unlikely that some of the strongest radio signals in the heavens and the strange visual object are not related.

Science News Letter, December 12, 1953

E FIELDS

VETERINARY MEDICINE

Handle Brucellosis Vaccine With Care

➤ A WARNING to use care in handling strain 19 when vaccinating cattle against brucellosis is given by Drs. Wesley W. Spink and Hugh Thompson of the University of Minnesota Hospitals and Medical Schools in the *Journal of the American Medical Association* (Nov. 28).

Two veterinarians got sick after accidentally getting some of this *Brucella abortus,* strain 19, into their bodies, the Minneapolis doctors report. This is the first time that scientists have had proof that strain 19 can cause the sickness in humans.

Use of strain 19 in the campaign to wipe out brucellosis, also called Bang's disease and infectious abortion in cows, should not be curtailed because of this report, the doctors state.

Brucellosis is a serious, sometimes fatal disease in humans who can get it from infected animals and from milk and milk products from infected cows if the milk has not been pasteurized. Efforts to protect cattle and, through them, humans, should continue, the Minneapolis doctors imply, although they state that strain 19 should be used "cautiously and only by properly qualified persons."

The two veterinarians who got brucellosis from strain 19 got the germs in their bodies, in one case, when the needle of the vaccine syringe accidentally stuck his hand and, in the other, when the vaccine splashed into his eyes.

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MEDICINE

Cancer Pessimism No Longer Warranted

➤ "THE PALL of pessimism" which surrounds the attitude of many people toward treatment of cancer in general and cancer of the lung in particular is "less warranted today than at any time in history," Dr. Duane Carr of the University of Tennessee College of Medicine declared at the meeting of the American Medical Association in St. Louis.

Many lung cancers, he said, are being cured by early diagnosis and complete surgical removal before the cancer has had a chance to spread. Many of these cancers are being detected in the early, curable stage by routine chest X-rays.

Unfortunately, Dr. Carr said, too many people never have these routine chest X-rays. But even for those whose cancers have advanced beyond the stage of surgical removal and cure, deep, high-voltage X-ray treatments and nitrogen mustard and melamine can relieve symptoms and bring renewed energy and feeling of well-being for a time.

Important aid to early discovery of lung cancer, heart disease and tuberculosis is the expanding program of routine small film chest X-rays, Dr. John H. Skavlem of Cincinnati declared. He reported that more than 15,000,000 such X-rays are now being taken annually, and commended the 700 or so hospitals in the United States that are routinely taking chest X-ray pictures of all patients as they are admitted to the hospital, regardless of the condition for which they enter.

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PLANT PATHOLOGY

Tobacco Plants Live Weeks Without Oxygen

➤ FLUE-CURED TOBACCO plants can live at least two weeks without oxygen, C. H. M. van Bavel of North Carolina State College reported to the American Society of Agronomy meeting in Dallas, Tex.

Streams of mixed gases were forced into sealed containers of growing tobacco plants for periods of two weeks. Contrary to expectations, the plants did not die when completely deprived of oxygen, he said.

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MEDICINE

New Medical Group to Humanize Patient Care

➤ A NEW medical group that aims to improve and humanize medical care by treating the patient's sick feelings and sick organs at the same time has been organized.

It is called the Academy of Psychosomatic Medicine. Its officers are: president, Dr. William Kaufman of Bridgeport, Conn.; vice-president, Dr. B. B. Raginsky of Montreal, Canada; secretary, Dr. Ethan Allan Brown of Boston, Mass., and treasurer, Dr. Alfred J. Cantor of Flushing, N. Y.

Members will be leading surgeons, rehabilitation experts, internists, anesthesiologists, ophthalmologists, gynecologists, obstetricians, psychiatrists, hospital administrators, pediatricians, geriatricians, dermatologists, allergists and other medical specialists. The important work of this organization will be carried out through clinical and laboratory research, medical meetings and forums, and through creation of a new medical journal.

"Today's patient," Dr. Kaufman points out in explaining the aims of the new group, "while benefiting from the newest technological advances, is often treated as if he were a sick liver, nose, pair of lungs or heart, rather than an ailing human being. By treating not only the disease but also the person who has it, a doctor, regardless of his specialty, can increase the effectiveness of his treatment, and at the same time prevent crippling psychosomatic reactions to illness which a patient might otherwise have."

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AGRICULTURE

Grass With Deep Roots Resists Drought Best

➤ DEEP ROOTS are the best assurance a farmer can have that his field grass for cattle grazing will resist drought conditions, Dr. Glenn W. Burton, Earl DeVane and R. L. Carter of the U. S. Department of Agriculture told the American Society of Agronomy meeting in Dallas, Tex.

The roots of Coastal Bermuda grass reach a depth of eight feet within three months after late March planting. This gives the grass a larger feeding area and it can tap any water at the lower depths during times of drought, they reported.

Other drought-resistant varieties are Pangola grass with roots six feet deep in three months, and Bermuda and Dallis grass with roots four feet deep in that time.

The scientists checked the depth of root growth by planting the grass in sod squares over placements of radioactive phosphate fertilizer at different depths in a sandy soil. When the roots reached the radioactive phosphate layer, this could be detected by a Geiger counter placed near the above-ground parts of the plant that would react to any radioactive elements in the sap.

Grasses such as common Bahia, Pensacola Bahia, tall fescue and carpet grass with roots that penetrate very slowly are much less drought resistant. In three months these grass roots had only gone two feet into the soil.

All these grasses are commonly used by cattle growers for forage crops. They are seldom used for lawns though Bermuda grass is sometimes found in southern states in lawns.

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SURGERY

Skin Grafts Repair Internal Organs

➤ SURGEONS HAVE now successfully grown skin from the outside of the body on the inside. The success of this operation promises many new clinical applications of skin grafts, ranging from replacement of blood vessels to repair of bleeding livers.

In experiments on 35 adult dogs by Dr. Charles Horton and other surgeons of the Medical School of Duke University, division of plastic surgery, grafts from the outer skin of the animals were placed on various organs in the abdominal cavity, including the liver, spleen, intestine and stomach. All of these grafts grew well.

The surgeons are hopeful that the continuation of these experiments will lead the way to the application of grafts intra-abdominally in human surgery. In fact, they have observed such a dramatic effect of skin grafts on bleeding surfaces of the liver that they would now advocate their use for the control of hemorrhage if liver bleeding appeared otherwise uncontrollable.

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GENERAL SCIENCE

Toys Serve Child and Man

Many toys this Christmas will bring happiness to children. Some may shape your youngster's future. Still other "toys" have been at work all year saving lives.

See Front Cover

By ALLEN LONG

➤ AS CHRISTMAS nears, more and more toys will disappear from the counters of stores to be smuggled home in mysterious packages and stashed away in places considered incredibly clever by parents, stupidly obvious by their offspring.

On Christmas eve, the children will go to bed eager for four o'clock to come. In their shiny eyes, four o'clock is a perfectly respectable hour for getting up on Christmas day.

And at five o'clock, many parents will submit to their children and arise, even though worn out from a hard night's work.

The colorful lights of the Christmas tree will twinkle brightly in the early morning darkness. Electric trains will circle their tracks, movie projectors will whir, doll babies will look up into soft, loving eyes and cry "Mama," and bicycles will be pushed outdoors into the breaking dawn.

Many children will feel they are as close to Heaven as it is possible to be on this earth.

Toys always have had a tremendous impact upon children. For centuries toys have made youngsters happy. In some cases, toys have even shaped the child's future. It could happen under your Christmas tree this year.

A toy microscope given at the right time might start Mary on a brilliant career in biology. A chemistry set capable of turning out stink bombs might open the door to Jack's later pursuit of a profession in nuclear chemistry.

A magnet; a string-walking gyroscope; a set of plastic modeling "clays" that can be baked into permanent form; an inexpensive telescope, or perhaps the make-it-yourself kit; a spaceman's outfit—all these and more can hold the destiny of your child beneath their colorful Christmas festoons.

Although toys delight children the year around, they also serve man. Jurist, scientist and Indian alike have found that toys can be used to get ideas across, to test new theories, to explore new horizons.

Painted on the bench in an Atlanta traffic court is a street intersection. Toy automobiles from the five and dime store help officers and violators demonstrate graphically to the judge how the accident occurred.

Attached to the bottom of an overhead carrier car, a model airplane rests in a long rectangular tank of water at the National Advisory Committee for Aeronautics' laboratory at Langley Field, Va. As the car gathers speed and roars down its overhead track, the floating airplane hops up on new-design hydro skis, skims along the smooth water, then takes to the air.

Test Amphibious Designs

Armed with movie cameras and sharp eyes, scientists analyze the toy's performance, evaluate the new design, make improvements, then perhaps report to U. S. Navy officials that a solution has been found to the perplexing problem of lifting a half-submerged amphibious airplane from the water and getting it into the air.

In another large water tank at the Navy's David Taylor Model Basin, Carderock, Md., other scientists at the same time may be criticizing the performance of a model aircraft carrier. Perhaps it is of a radically new shape, a design aimed at converting into speed every ounce of power generated by a new atomic power plant.

These "toys" have been harnessed to science. They have been made to reveal facts of design and to predict performance.

HOPI DOLL—This kachina doll represents a Hopi dancer impersonating a tribal deity. Dolls such as this are used to teach religion to the Hopi children.

They provide scientists with reliable data at a minimum of cost. In some ways they are shaping America's future.

Other such "toys" have been used where a hazard to life is involved. A bleeding dummy man is the Navy's latest artifice that can help First Aid students learn the elements of life saving.

Another dummy man, based on measurements taken of 1,200 British airmen, has been built to show what happens to an unconscious pilot who has bailed out of his high-flying supersonic plane. The dummy's "bones" snap at the proper pressures and

he tumbles through the air at true-to-life speeds before his parachute opens. His checkered suit makes him easy to spot through field glasses as he plunges to his possible "death." But as a result of his trials, more safety is seeping into the Royal Air Force.

Complete with mustache, the propped-up dummy, shown on the cover of this week's SCIENCE NEWS LETTER, has helped Northrop Aircraft engineers with deceleration experiments conducted for the Air Force.

Automobile safety engineers have found that objects resting on the back-seat shelf of a car can be as deadly as shrapnel in an accident. Cans, books, screwdrivers, chalk, toys and other such things that accumulate on that small shelf have become deadly missiles in test crashes, flying through the air sometimes with enough force to smash the skulls of persons in their paths. Dummies proved the theory.

As scientists use toys to reveal the unknown, so do non-scientists use toys to instruct. Hopi Indians living in the Southwest make dolls for their children. The dolls are not toys to be played with. They are more like the scientist's toy. They instruct the children in Hopi religion.

Called kachina dolls, the little figures are given to Hopi children from December to July. They are hung up where the child can study them and learn about the supernatural spirits as they exist in the minds of the Hopis. Some of the dolls are carved from roots of dead cottonwood trees and represent masked Hopi dancers who impersonate the supernatural beings at religious ceremonies.

Dolls play a small part in Eskimo culture. Occasionally the Eskimos carve dolls of bone or ivory to represent deceased persons. The figurines are taken to big tribal feasts and are "fed" so that the departed may continue to enjoy the company and good times of old friends.

The motion picture industry uses "toys" to great advantage where it would be impossible or impractical to photograph the real thing. Models of great cities frequently are so excellently done that only the practiced eye can detect trickery.

Models also permit movie makers to present out-of-this-world shots found in some science fiction pictures.

Other "toys" that play big roles are models of buildings, parks, houses and the like. These models show in reasonable detail what the layman may be unable to visualize from a bundle of blueprints. The models often help sell the project to the customer. In some cases, they also can help the architect or contractor make more precise estimates of certain construction materials needed.

A scale model of a dam under construction near Kingsport, Tenn., helped TVA engineers provide for the proper discharge of water over the actual dam's spillway. Water flowed through a channel contoured to the physiography of the actual site. All elements affecting water flow were accounted for in the model, even to floating brush.

Situated in a large brick building which houses the TVA Hydraulic Laboratory at Norris, Tenn., the model gave engineers the needed data which enabled them to prevent destructive erosion downstream of the actual dam, and helped them circumvent destructive eddy currents. Both erosion and eddy currents are capable of endangering the dam itself.

By no means are these the only ways in which toys and "toys" can serve mankind. But the examples cited above should show that toys play big roles the year around. It probably is indisputable, however, that they reach their height of popularity each Dec. 25.

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• Books of the Week •

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

CAUSES OF INDUSTRIAL PEACE UNDER COLLECTIVE BARGAINING: Working Harmony, A Summary of the Collective Bargaining Relationships in 18 Companies—Frederick H. Harbison and John R. Coleman—*National Planning Association*, Case Study 13, 64 p., paper, $1.00.

CHROMATOGRAPHY: A Review of Principles and Applications—Edgar Lederer and Michael Lederer—*Elsevier*, 460 p., illus., $9.25. Presenting a review of the chromatographic methods developed in the last decade. Included are references to papers contributing to the development of new methods or to the application of chromatography to new groups of substances.

INTRODUCTION TO SEMIMICRO QUALITATIVE ANALYSIS — C. H. Sorum — *Prentice-Hall*, 2nd ed., 198 p., $3.50. Written for students who have a background of one semester of general chemistry and wish to study qualitative analysis in a one-semester course.

A FIELD GUIDE TO ROCKS AND MINERALS—Frederick H. Pough—*Houghton Mifflin*, 333 p., illus., $3.75. All the common minerals, as well as a few rare ones, are included in this book, written both for the serious collector and the beginner. The many diagrams, drawings and photographs will help make field trips more rewarding.

DISCONTINUOUS AUTOMATIC CONTROL—Irmgard Flugge-Lotz—*Princeton University Press*, 168 p., illus., $5.00. Mechanical systems which have restoring forces, other than that of the control device, are discussed in this monograph.

KODAK PHOTOGRAPHIC PLATES FOR SCIENTIFIC AND TECHNICAL USE—*Eastman Kodak Company*, 7th ed., 40 p., illus., paper, 50 cents. Revised to include the latest technical information on the characteristics of Kodak spectroscopic plates, film and other materials prepared for research use.

MAN'S RIGHT TO KNOWLEDGE AND THE FREE USE THEREOF — Mark Van Doren — *Columbia University*, 123 p., illus., paper, 35 cents. Prepared in conjunction with the university's bicentennial celebration, and illustrated by the 60 panels which will make up the exhibit.

THE NATIONAL RESEARCH COUNCIL REVIEW 1953—C. D. Howe, Chairman of Committee of the Privy Council on Scientific and Industrial Research—*National Research Council of Canada*, 244 p., illus., paper, 75 cents. Reporting the progress made during 1952 on the many research projects of the Council. Intended for scientists and others concerned with detailed information.

NUCLEAR PHYSICS — W. Heisenberg — *Philosophical Library*, 225 p., illus., $4.75. This book by a Nobelist is, nevertheless, intended for readers with no previous, formal training in physics.

OBSERVATIONS ON THE LIFE HISTORY AND SENSORY BEHAVIOR OF THE SNAKE MITE, OPHIONYSSUS NATRICIS (GERVAIS) (ACARINA: MACRONYSSIDAE)—Joseph H. Camin—*The Chicago Academy of Sciences*, 75 p., illus., paper, $1.50. The snake mite is a common pest in zoos throughout the world.

PHYSICAL-CHEMICAL PROPERTIES OF METHANE-ETHANE MIXTURES—O. T. Bloomer, D. C. Gami, and J. D. Parent—*Institute of Gas Technology*, 39 p., illus., paper, $3.50. Giving data required for the engineering design of plants to separate ethane from natural gas by low-temperature fractionation.

RESPIRATORY DISEASES AND ALLERGY: New Method of Approach—Josef S. Smul—*Medical Library*, 80 p., $2.75. The purpose of this book, the author states, is to clarify the nature of respiratory ailments by indicating their common cause and presenting a simple, definite method for their treatment.

SONGBIRDS IN YOUR GARDEN—John K. Terres—*Crowell*, 274 p., illus., $3.95. Explains how to attract birds to your garden or yard.

THE TRAFFIC IN NARCOTICS—H. J. Anslinger and William F. Tompkins—*Funk and Wagnalls*, 354 p., illus., $4.50. An attempt to present the facts, review the evidence and reach some conclusions that may help in establishing sane, progressive and healthy public attitudes and action toward the national problem of drug addiction.

WORLD-WIDE ENFORCEMENT OF STRATEGIC TRADE CONTROLS: Third Report to Congress on the Mutual Defense Assistance Control Act of 1951—Foreign Operations, Harold Stassen, Director—*Gov't Printing Office*, 96 p., illus., paper, 30 cents. This State Department publication rivals the "special agent" programs of radio and television in exciting plots.

YOUR MIND AND YOUR JOB—John K. Williams—*Industrial Health Council*, 64 p., illus., paper, single copies 50 cents. Good mental health helps you do a better job and be a happier person. This fact is pointed up in this booklet which discusses, in simple terms, you and your job.

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AGRICULTURE

Bee Colony Each Acre Increases Cranberry Crop

➤ FARMERS CAN double their production of holiday-season cranberries by increasing the number of bees per acre, Prof. R. S. Filmer of the New Jersey Agricultural Experiment Station, New Brunswick, has found.

New Jersey cranberry production averaged 16.3 barrels per acre in 1952 with one colony of honeybees for two acres. Production can be increased by 12 to 34 barrels per acre in fields with a colony of bees for each acre, he said.

To produce fruit, cranberry flowers must be pollinated by bees. A larger population of bees means more flowers are pollinated and produce fruit, Prof. Filmer discovered.

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Books Worth While Giving

SCIENCE SERVICE PUBLICATIONS

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1 ATOMIC FACTS

Just the information about atomic energy that you need to know. Easy to read chapters and fundamental information arranged for easy reference. The H-Bomb . . . Our Atomic Future . . . Structure of the Atom . . . How Atomic Bombardment Works . . . Birth of Matter . . . Neutron-Proton Exchange . . . Mesons Created in the Cyclotron . . . The Atomic Nucleus . . . Electron Shells . . . Units of Mass, Charge and Energy . . . Atomic Energy Common, Fire Rare . . . Atomic Energy Progress . . . Atomic Energy Engineering . . . Uranium Prospecting . . . Radioactive Wastes . . . Acute Radiation Illness . . . Isotopes Report Reactions . . . Photographing Nuclear Particles . . . Radiation Detection Instruments . . . In Case of Disaster . . . Naming the Isotopes . . . First Tracer Chemistry . . . Prediction of the Neutron . . . The First Tritium . . . Slow Neutron Bombardment. Fully indexed, cloth bound. Postpaid **$2.00**

2 CHEMISTRY SHOW BOOK

For youth who want to conduct experiments, build exhibits and present entertainments upon a chemical theme, this is the book. Three chemical plays are included that can be staged by any group. How to produce chemical surprises. All about fireworks and colored flames. Experiments for the home laboratory explained in simple directions. How to put on a show and demonstrate before an audience. How to make a speech about chemistry. Photography and photographic displays. Chemical quiz corner with answers. Fully indexed, cloth bound. Postpaid **$2.00**

3 EXHIBIT TECHNIQUES BOOK

When it is time to show off a science project in science fair or exhibition, the ideas, hints and experience packed into this comprehensive volume will prove invaluable. Many exhibits that have won prizes are pictured in photographs and diagrams as helpful suggestions that can help your own original planning and thinking. What to guard against in laying out your material. How to label, letter and display. Ideas from professional museum preparators. Simple experiments that will be models for those that you will incorporate in your project. How to build a diorama, revolving platform, changing lighting, make models, etc. Fully indexed, cloth bound. Postpaid **$2.00**

4 THE CHEMICAL ELEMENTS

Their properties, sources, most important isotopes, characteristic compounds, places in the periodic table and the qualitative analysis scheme, and the histories of their discoveries, all brought together in a compact handbook. Fully indexed, cloth bound. Postpaid **$2.00**

5 THE CHEMISTRY WE USE

A compilation of "Home Lab" experiments, a monthly feature of CHEMISTRY magazine. Written by Burton L. Hawk . . . and designed for a simple but adequate home laboratory in which real chemical preparations can be made . . . The World We Live In, The Air We Breathe, The Water We Drink, The Food We Eat, The Clothing We Wear, The Coins We Spend, The Drugs We Take, Lesser-Known Elements We Study, Other Materials We Use . . . **A Practical Introduction to the Chemistry of Everyday Things.** Fully indexed, cloth bound. Postpaid **$2.00**

6 USE OF TOOLS *and* FUNDAMENTALS OF MECHANICS

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His big book, *Norman Ford's Florida,* tells you, first of all, road by road, mile by mile, everything you'll find in Florida, whether you're on vacation, or looking over job, business, real estate, or retirement prospects.

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Questions

AERONAUTICS—What kinds of degrees are needed for specializing in rocketry? p. 375.

□ □ □

AGRICULTURE—What kind of grass resists drought best? p. 377.

□ □ □

GENERAL SCIENCE—How many people are contacted during the successful completion of one round of a five-name chain letter? p. 372.

How do some Hopis teach their children about religion? p. 378.

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STATISTICS—How many people lived in other than their birth state in 1950? p. 373.

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ICHTHYOLOGY

Aureomycin Checks Growth of Guppies

➤ THE GROWTH of guppies is checked by aureomycin, famous so-called mold remedy for many germ diseases. This growth-checking effect on the guppies is the reverse of its effect in other animals, such as chicks and pigs, when fed in addition to their regular diet.

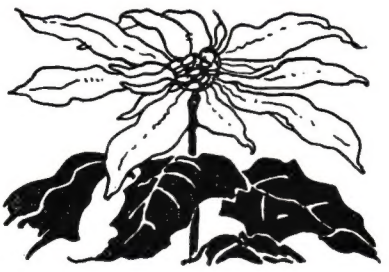
This unexpected finding was made by Drs. Phillip Berke, Albert M. Silver and Herbert S. Kupperman of the Sutton Laboratories and Diagnostic and Endocrine Laboratories, Newark, N. J., and New York University-Bellevue Center, New York.

Whether this means aureomycin has a different effect on fish than on birds and mammals is not yet known. Dr. Berke and associates found that an overgrowth of the mold, *Monilia albicans,* occurred in the water of the aquarium to which aureomycin had been added. This might have been a factor in checking the growth of the guppies.

Science News Letter, December 12, 1953

BOTANY

NATURE RAMBLINGS



Poinsettia Pointers

➤ THIS IS a critical time for poinsettias. Whether this festive plant will lend its flaming red bracts to the brightness of the Christmas season depends largely on how well it survives pre-Christmas hazards.

Poinsettia goes by a variety of names: Christmas Flower, Easter Flower, Lobster Flower, Mexican Flame-Leaf. It grows wild in moist, shady areas of Mexico and Central America.

In the home, we are not likely, without special effort, to supply its natural rhythm of light and dark.

Of all possible measures to induce the brightest display by Christmas, the most important is the regulation of light. Scientists of the U. S. Department of Agriculture have found that as little as an hour's exposure to minute quantities of light nightly for three weeks is enough to prevent the poinsettia from flowering.

The red bracts of poinsettia are actually one of the two kinds of leaf that the plant produces. The other, of course, is the glossy dark green leaf that contrasts with the bracts in the traditional cheerful Yuletide colors. The flowers proper are tiny club-shaped objects at the center of the red bracts.

There is a large group of plants that share this distinctive manner of flowering which goes under the botanical name, euphorbia.

Science News Letter, December 12, 1953

Vacuum drying procedures have been developed that speed the production of low-moisture powders from *juices* of seven fruits.

• New Machines and Gadgets •

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 704. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

⚙ *MODEL TOWN can be built up by children from separate items now available. Made of styrene and vinyl plastics, the new items include traffic lights, street lights, fire hydrants, houses, stores, a church, theater, schools and railway stations. Doors on the model buildings actually open and the stores have interchangeable sign and window display cards.*

Science News Letter, December 12, 1953

⚙ *CHILD'S RAINSUIT transforms him into a spaceship commander on grizzly days when he must be outdoors. Made of a lightweight, sturdy, water-resistant material, the silver-toned suit resembles coveralls and has a long zipper in front which permits the child to get in and out of it easily. A "helmet" ties under the youngster's chin.*

Science News Letter, December 12, 1953

⚙ *TYPEWRITER BAIL is made of a transparent plastic which permits the typist to see the typewritten line usually obscured by the common metal bail. It is available for all standard machines and can be installed quickly.*

Science News Letter, December 12, 1953

⚙ *PLASTIC ALPHABET blocks have snaps on them that permit the blocks to be joined into a string, as shown in the illustration. Children form words merely by snapping the blocks together. The blocks can be rotated while joined. A quick pull unfastens them. Enclosed picture word cards help the child associate words and objects.*

Science News Letter, December 12, 1953

⚙ *LETTER SET for preschool children consists of five basic letter shapes, plus parts needed to build all letters in the alphabet. The vinyl plastic letter parts stick to glossy surfaces but strip off easily and can be reused. A colorful book of text and pictures helps the child learn simple words while he plays.*

Science News Letter, December 12, 1953

⚙ *DECORATING KIT permits the user to dress up his Christmas parcels and stockings and to make cheerful Christmas signs. The kit consists of a "tube pen" that is squeezed while tracing the message on glass, paper, wood, cloth and metal. Then tiny spangles are sprinkled over the "writing" and are bonded into place. The spangles are available in red, green, gold, silver, blue and chartreuse.*

Science News Letter, December 12, 1953

⚙ *ALUMINUM SHEETING, rods, bars, angles and tubing now are available for the home craftsman and can be sawed, planed or drilled with ordinary woodworking tools. The aluminum comes in a variety of shapes and finishes and can be made into storm windows as well as ashtrays, dishes and candle holders.*

Science News Letter, December 12, 1953

⚙ *ELECTRIC HAIR DRYER blows cool or warm air at the flick of a switch. Although the portable device is designed for milady, the manufacturer whispers that husbands can use it in their photographic darkrooms. It makes a fine dryer for negatives and reel-type developing tanks.*

Science News Letter, December 12, 1953

Do You Know?

Some *tree crops* are harvested about every 100 years.

Still in serviceable condition, samples of 2,000-year-old *concrete* recently were recovered from an ancient submerged Roman wharf.

Through *vocational rehabilitation*, over 60,000 persons are put to productive work each year.

Vibration causes as much damage as heavy shock blows to delicate equipment carried on Navy ships.

Once considered and treated as a moral lapse, a sin or a crime, *alcoholism* now is more often viewed as a disease resulting from disturbances in the normal functions of mind or body.